We want your feedback. Please contact smo@msfc.nasa.gov to give comments, make suggestions, or ask questions about this checklist.

National Aeronautics and Space Administration

George C. Marshall Space Flight Center

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MSFC Project Review

Checklist

To be effective, a project review must address the critical issues facing a project and determine the project's viability and likelihood of achieving mission success within cost and schedule commitments. This checklist is intended as an aid in conducting both independent and management level project reviews. While not all items apply to every project, prudent tailoring should allow for effective evaluation of any project.

Requirements

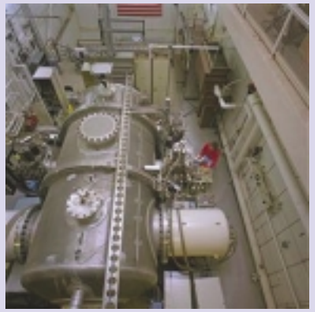
- ❑ Are level I requirements clear and consistent? Are they clear and traceable from Agency policy? Are they being communicated and followed?
- ❑ Are level I requirements reasonable and achievable?
- ❑ Do minimum and full Mission Success Criteria exist? Are the criteria relevant and measurable? Is "Mission Success First" reflected in top-level requirements?
- ❑ Are requirements flowed down from level I through the appropriate lower level?
- ❑ Are requirements specific and realistic at the appropriate level?
- ❑ Do projects within the program directly support a requirement? Do they have an "allocation" in support of a program goal?
- ❑ Are there partners external to NASA with requirements? Does the program clearly understand these external requirements?
- ❑ To what extent is the program driven by commercial needs? Are commercial viability requirements identified and documented?
- ❑ How is the program applying "lessons learned" from other NASA programs?
- ❑ Have exit criteria for significant milestones been identified?
- ❑ Are there termination requirements?
- ❑ Have the PCA/Program/Project plans been approved?

Technical Performance

- ❑ Have sufficient trade studies been completed at the mission, element, system, and subsystem level?
- ❑ Is there sufficient technical analysis in all elements, systems, subsystems, and technical disciplines to provide assurance of the ability to meet the requirements?
- ❑ Is redundancy policy adequate, well understood, and communicated to the entire team? Is it being followed?
- ❑ Are all margins adequate?

Validation and Verification

- ❑ Is there a credible verification and validation plan?
- ❑ Is the verification matrix complete?
- ❑ Are the processes sound?
- ❑ Are checks in place to ensure processes are being followed?
- ❑ Does every process have an owner?
- ❑ Is mission-critical software identified in the flight and ground systems?



- ❑ Are processes developed for validation of system interfaces? Are facilities scheduled for simulation, verification, and validation?
- ❑ Is independent validation and verification planned for flight and ground software?
- ❑ Are plans and procedures in place for normal and contingency testing?
- ❑ Is time available for contingency testing and training?
- ❑ Are tests repeated after configuration changes?
- ❑ Are adequate end-to-end tests planned and completed?

Technology Readiness

- ❑ Is any new technology needed that has not adequately matured?
- ❑ Has all appropriate new technology been considered?
- ❑ Is new technology maturing on schedule?
- ❑ Does it represent low deployment risk?
- ❑ Does it represent acceptable deployment risk?
- ❑ Is there a plan in place to train operations personnel on new technology use and limitations?
- ❑ Has the project identified clear TRL transition criteria?

Operations

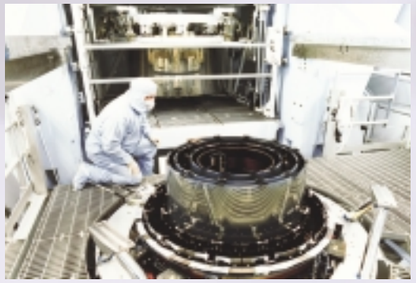
- ❑ Has a mission operations concept been documented?
- ❑ Have appropriate mission operations system (hardware and software) trades been completed?
- ❑ Are there plans to integrate the operations team into the flight hardware development effort to help ensure a qualified operations team?
- ❑ Is a transition from the integration and test ground system to a new operations ground system planned? If so, is there a plan and schedule to revalidate databases and procedures?
- ❑ Has contingency planning been validated and tested?
- ❑ Are all teams trained to execute contingency plans?
- ❑ Have mission rules been formulated?
- ❑ Has the operations team executed mission rules in simulations?
- ❑ Are plans in place to ensure visibility and real-time telemetry during all critical mission phases?

Cost

- ❑ Will this project overrun its budget?
- ❑ Will project tasks overrun their budgets?
- ❑ Are there identified reserves and are they adequate?
- ❑ Is there a credible government cost estimate? Does it show adequate budget remaining?
- ❑ Are the contractor's estimates credible? How have they been performing to date (533's, earned value)?
- ❑ Are there adequate cost control systems planned and in place? Are costs tracked by the Work Breakdown Structure (WBS)?
- ❑ Are technical managers taking ownership of the cost plan?
- ❑ Has mission success been compromised as a result of cost?
- ❑ Is staffing adequate? Is funding adequate for staffing levels?
- ❑ Are all phases of the mission staffed?

Schedule

- ❑ Is this an integrated logic network or just a task list?
- ❑ What is the critical path?
- ❑ What is the 2nd critical path?
- ❑ What is the difficulty level (e.g., technologies, development, etc.) of the items on the critical path? What are high-risk items on the critical path?
- ❑ How does the schedule allow for these difficulties? What is the mitigation plan for high-risk items on the critical path?
- ❑ What are the constrained dates in the schedule?
- ❑ How much slack is carried in the schedule? Where is it located?
- ❑ What are long lead-time items and where are they scheduled?
- ❑ What is the calendar for the schedule? (e.g., days per week, holidays, shut down, etc.)
- ❑ How have noninterruptible tests been handled? (e.g., thermal, calibration, etc.)
- ❑ Are there predecessors and successors for each task?
- ❑ Does the schedule reflect the WBS?
- ❑ Are low, intermediate, and master level schedules integrated?
- ❑ What is the staffing plan?
- ❑ Is the schedule resource loaded?
- ❑ If any, what are potential facility/equipment conflicts?
- ❑ Is the schedule baselined and under Configuration Management (CM)? If not, when is it planned?
- ❑ How is rework carried in the schedule?



- ❑ What is the process for schedule managing and reporting (especially for very large schedules or programs with several partners and contractors)?
- ❑ Are time scales for development decisions and technology readiness reasonable and credible?
- ❑ Are technical managers taking ownership of the schedule?
- ❑ Has mission success been compromised as a result of the schedule?
- ❑ Have exit criteria for significant milestones been identified?

Risk Management

- ❑ Has the acceptable level of risk been identified and bought into at all management levels?
- ❑ Are risks identified? Is there a credible risk management plan in place?
- ❑ Are "unknown unknowns" anticipated and is there a margin to deal with them?
- ❑ Are risks integrated with cost and schedule estimates? Is this integrated view presented and/or discussed at least monthly?
- ❑ Are analysis measures in place (e.g., Failure Modes and Effects Analysis, Fault Tree Analysis, and Probabilistic Risk Assessment)?
- ❑ Have single-point failures been identified and justified?
- ❑ Has special attention been given to proper reuse of hardware and software?
- ❑ Has extensive testing been done in the flight configuration?
- ❑ Have potential failure scenarios been identified and modeled?
- ❑ Is there a culture that never stops looking for possible failure modes?

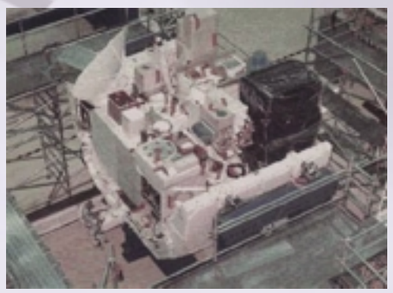
Management

- ❑ Is this the "right" NASA management team? Is this the "A" team?
- ❑ Is this the "right" contractor team? Is this the "A" team?
- ❑ Are government and contractor roles well defined?
- ❑ Are the Centers working together? Is there duplication of effort? Are the Centers sharing and integrating information and results?
- ❑ Has the "right" balance between in-house and contracted work been achieved?
- ❑ Does the project have sufficient insight and oversight of the contractors? How often is the project meeting with and communicating with contractors?
- ❑ What is reported to higher-level management on a monthly basis? Are cost, schedule, and technical issues and associated risks presented as an integrated picture?

- ❑ Are there overtime guidelines in place to prevent burnout?
- ❑ Have other forces (e.g., Political and Agency/Center Management) influenced the program management to do things they really wouldn't otherwise have done?
- ❑ Does the project have an appropriate level of foreign involvement? Are safeguards in place to prevent proliferation of sensitive technologies?
- ❑ Is a plan in place to ensure senior management oversight of the project?
- ❑ Is a plan in place to ensure line organization commitment and accountability?
- ❑ Is a plan in place to mentor new and/or inexperienced managers?
- ❑ Are extensive peer reviews conducted at the system/subsystem level?
- ❑ Is there a plan for spacecraft disposal?
- ❑ Have key personnel remained somewhat consistent since the last review?
- ❑ Are accountability and responsibility at the right levels?
- ❑ Is electronic/Web-based documentation available? Is a process of continuous documentation in place to support unanticipated personnel changes? Is appropriate documentation complete for this phase of the project?

Team/Communication

- ❑ Are decisions being made in a timely manner?
- ❑ Is "Mission Success First" clearly communicated throughout the organization?
- ❑ Are open communications evident, with all parties having an opportunity to be heard?
- ❑ Is a "Top 10", or something similar, reviewed and acted upon weekly?
- ❑ Are all team members encouraged to report problems?
- ❑ Do all team members understand that the only real success is mission success?
- ❑ Is safety the number-one priority?
- ❑ Has team chemistry been considered, and personality profiles reviewed?
- ❑ Are people who could not demonstrate teamwork gone?
- ❑ Is the team adequately staffed and trained in the processes?
- ❑ Are team members supportive and open with one another, review boards, and management?
- ❑ Does the team actively encourage peer reviews?



- ❑ Does the team understand that arrogance is their number-one enemy?
- ❑ Does the team understand that "anyone's problem is my problem?"
- ❑ Does the team have assessment metrics that are evaluated regularly?

Continuity/Hand Overs

- ❑ Are hand overs planned?
- ❑ Are special plans in place to ensure a smooth transition?
- ❑ Do core people transition? Who? How many?
- ❑ Is a development-to-operations transition planned?
- ❑ Does development-team knowledge exist in the operations team?
- ❑ Have there been changes in management or other key technical positions? How was continuity ensured?
- ❑ Have processes changed? If so, has the associated risk been evaluated?

Systems Engineering

- ❑ Is this a program driven by systems engineering?
- ❑ Are systems engineering efforts effective?
- ❑ Are systems engineering personnel adequately trained and are they effective?
- ❑ Does mission architecture provide adequate data for failure investigation?
- ❑ Is "Mission Success First" reflected in the trades and systems efforts?
- ❑ Is there a formal process to incorporate lessons learned from other successful and failed missions?
- ❑ Has the team conducted reviews of NASA lessons-learned databases early in the project?
- ❑ Is a rigorous change control process in place?
- ❑ Have design decisions and limitations been documented and communicated?
- ❑ Is a process of continuous documentation in place to support unanticipated personnel changes?
- ❑ Is electronic/Web-based documentation available?

Mission Assurance

- ❑ Is Mission Assurance staffing adequate?
- ❑ Are all phases of the mission staffed with Mission Assurance personnel?
- ❑ Is Mission Assurance conducting high-level oversight to ensure that robust mission success processes are in place?